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## *MAINTAINING MEDICAL SUPPLY SET STANDARDIZATION ACROSS NAVAL PLATFORMS*

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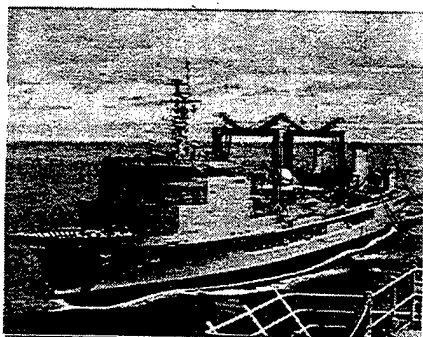
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## Maintaining Medical Supply Set Standardization Across Naval Platforms

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## **Summary**

### **Issue**

To address the increasing complexity of the Fleet's Authorized Minimal Medical Allowance List (AMMAL) system, the Naval Medical Logistics Command developed an organizational structure that provides the Fleet with a common base of medical supplies, giving each force type the same core capability. To account for the differences in level of clinical care within the force types, a supplemental AMMAL was also created for each platform. This resulted in 2 AMMALs each for the Independent Duty Corpsmen ships, submarine fleet, sub tenders, General Medical Officer/Physician Assistant ships, amphibious assault ships (LHA/LHDS), and aircraft carriers.

The spirit and intent of the designers to simplify and standardize the Fleet's 2,749 individual pieces of medical materiel have remained in place; however, over time, some error has been introduced into the system. To ensure core items remain the same for each of the 6 platforms, it is important to view how each proposed change affects the overall system of organization before items are added or deleted from the Fleet's medical supply sets. Because standards of care and medical technology are continually changing, maintaining the organizational structure of the Fleet's AMMALs and ensuring item standardization across the 6 platforms is a formidable challenge.

### **Objective**

The objective of the current study was the development and evaluation of an automated method that examines the AMMALs and compares them in a way that identifies discrepancies so that errors may be addressed on an ongoing basis.

### **Approach**

To address the problem, the 12 different AMMALs for the 3 different force types were combined and then separated into core and supplemental AMMAL items. They were then compared to determine that each core item was present in each of the 6 core AMMALs. Subsequently, the AMMALs were then reorganized to ensure that none of the core items appeared in any of the 6 supplemental AMMALs. Finally, they were examined to ensure that none of the supplemental AMMALs had any items that were common to all 6 of the Fleet's supplemental AMMALs. To accomplish this objective a computer program was created that assembled each of the 12 AMMALs, searched for discrepancies, and produced spreadsheets summarizing findings.

### **Results**

Results revealed discrepancies in each of the potential views. These included (1) core AMMAL items that did not appear in all core AMMALs, (2) items that appeared both in all core AMMALs and in some supplemental AMMALs, and (3) items that appeared in all supplemental AMMALs. A total of 25 discrepancies were found.

## **Conclusions**

A significant amount of effort was required to develop and implement the concept of a core set of materiel. Preserving the results of this effort will require a periodic maintenance examination of the core/supplemental AMMALs. Correction of some discrepancies can be conducted on an administrative basis without requiring a review by clinical personnel. Other discrepancies, however, will require input from the type commands for remediation.

The core/supplemental organizational structure is a significant step forward in managing the Fleet's AMMALs and standardizing medical items across the operational force. The next step is to begin standardizing the Fleet's remaining 274 Authorized Medical Allowance Lists. The items in the current core and supplemental AMMALs would form a basic set of items. Many of the items in the remaining AMMALs are the same or serve similar purposes. These items could then be matched with the like items in the core/supplemental AMMALs and changed to reflect the single, standardized item.

## **Maintaining Medical Supply Set Standardization Across Naval Platforms**

### **Introduction**

The U.S. Navy maintains authorized sets of medical materiel needed for both routine deployments and emergent care aboard the ships of each of its 3 force types. The force types, Naval Air Force, Naval Surface Force, and Naval Submarine Force, each configure its medical supply requirements in Authorized Minimal Medical Allowance Lists (AMMALs). These AMMAL sets contain all the medical materiel necessary for ships' medical departments to effectively exercise their medical mission.<sup>1,2</sup>

Because of the continually evolving nature of medicine, these materiel lists are routinely changed to reflect advances in medical care and changes in the acceptable standards of care. Recommendations for changes in the AMMALs may be submitted by any member of the Navy's medical department. Typically, recommendations are submitted by the personnel in shipboard medical departments. The recommendations are moved up the chain of command and eventually are evaluated for approval by each of the force type commanders. Upon approval, the change request is forwarded to the Naval Medical Logistics Command (NMLC), where it is officially added to the appropriate ship's AMMALs.

Historically, this method of maintaining medical materiel for the Fleet has resulted in a high standard of care. However, over time the amount of materiel continually increased along with differentiation in the variety of the supplies carried by each of the force types. Therefore, it became difficult to effectively manage the shipboard sets of medical supplies.

To address the increasing complexity of the Fleet's AMMAL system, NMLC proposed an organizational structure that would provide the Fleet with a common base of medical supplies, giving each force type the same core capability. This core capability would be the same for each platform of each force type and would differ only in the quantities of each item. Therefore, there would be larger quantities of each item for the Fleet's aircraft carriers than there would be for submarines. The implementation of this concept of medical supply organization occurred during the Authorized Medical Allowance List Standardization Conference sponsored by NMLC (Fort Detrick, MD, October 14-24, 1997). At this conference, 6 core AMMALs were created, including one each of the following: small deck IDC surface fleet, submarine tenders, General Medical Officer (GMO)/Physician Assistant (PA) platforms, the carrier fleet, LHA/LHD decks, and the submarine fleet.

Because each of the 6 different fleet platforms have different medical department capabilities, additional AMMALs unique to each were required. Therefore, a supplemental AMMAL was created for each platform that would complement its core AMMAL by taking into account the differences in medical department capabilities. At the conclusion of the conference, 12 new AMMALs had been created. This included 6 core AMMALs identical in item type across the platforms, and 6 supplemental AMMALs that addressed each platform's unique medical requirements.

The core/supplemental system of organization has continued to serve the Fleet since the 1997 conference. The spirit and intent of the designers to simplify and standardize the Fleet's 2,749 individual pieces of medical materiel have remained in place; however, over time, some error has been introduced into the system. To ensure core items remain the same for each of the six platforms, it is important to view how each proposed change affects the overall system of organization. When, for example, one of the force types recommends a change to one of its AMMALs, it is necessary to view the effect on the organizational integrity of the remaining core and supplemental AMMALs of the Fleet. Error can occur, for example, when one force type suggests removing an item from its AMMALs. If the item is from the core AMMAL, a deletion would then affect each of the 5 remaining core AMMALs because that item would no longer be common to all 6 platforms. In this example, the item would then, by definition, revert to a supplemental item and have to be transferred to the appropriate AMMALs for the platforms that want to retain the item. Similarly, if an item is added to one of the AMMALs, it is important to assess whether the proposal may affect the organization structure by converting a once supplemental item to a core item.

Because standards of care and medical technology are continually changing, maintaining the organizational structure of the Fleet's AMMALs and ensuring item standardization across the platforms is a formidable challenge. Attempting to maintain the AMMALs' integrity manually is challenging at best. In an effort to assist in maintaining Fleet item standardization, the Naval Health Research Center (NHRC) developed an automated method that examines the AMMALs and compares them in a way that identifies discrepancies so that they may be addressed on an ongoing basis.

## **Method**

The problem of identifying discrepancies is apparent when the AMMALs are viewed across platforms. To address the problem, the 12 different AMMALs for the different force types must be combined and then separated into core and supplemental AMMAL items. They then must be compared in a way that allows the core items to be viewed such that it can be determined that each core item is present in each of the 6 core AMMALs. Subsequently, the AMMALs must then be reorganized so that they may be viewed such that it can be determined that none of the core items appear in any 6 of the supplemental AMMALs. Finally, they must be examined to determine that none of the supplemental AMMALs have items that are common to all 6 of the Fleet's supplemental AMMALs.

Visibility of all possible combinations of discrepancies required the AMMALs be viewed from three different perspectives. To accomplish this objective, NHRC created a computer program that assembled each of the 12 AMMALs, searched for discrepancies using National Stock Number (NSN) and item nomenclature as the search criteria, and produced spreadsheets summarizing findings.

## Results

The computer program was evaluated using the January 2002 AMMALs available on the NMLC Web site, [www.nmlc.navy.mil](http://www.nmlc.navy.mil). This involved downloading each of the 12 core/supplemental AMMALs and running the program. Results revealed discrepancies in each of the potential views. These included (1) core AMMAL items that did not appear in all core AMMALs, (2) items that appeared both in all core AMMALs and in some supplemental AMMALs, and (3) items that appeared in all supplemental AMMALs.

Table 1 shows the items that only appear in some but not all core AMMALs. It can be seen from the table that 18 items were inaccurately stocked in the core AMMALs. Presumably, these items were actually in all 6 core AMMALs at one time, but were subsequently deleted from one or more core AMMALs and not moved to the appropriate supplementals. In some of the examples, items appear both in some of a platform's core AMMALs and in some of its supplemental AMMALs as well. These examples are considered discrepancies because, by definition, no single item should appear both in a platform's core AMMALs and also in its supplemental AMMALs. Because the program uses nomenclature as a search criterion, like items with subtle differences such as Naproxen, are also flagged. In this example, the quantities in each bottle vary. By identifying such items, the type commands can review multiple items and determine if more than one kind of the same item is required or if some should be deleted to further Fleet standardization efforts.

Table 2 shows the results for the second outcome. Illustrated in this view are items that are in all cores and also in some supplemental AMMALs. These items represent those that appear in two different AMMALs on the same platform. Conceptually, these represent items that are stored in two different places on the same ship.

The final view of the AMMALs is presented in Table 3. The table shows that these items appear in all 6 of the Fleet's supplemental AMMALs. By definition, an item common to all platforms is considered a core capability and should therefore appear in each core AMMAL. Presumably, each of these items was a true supplemental item at one time. However, at some point, it seems likely that one or more platforms chose to add one of these items, thus converting the item's status to core. Such items then should have been moved to each platform's core AMMAL.



Table 1  
Items Appearing in Some Core AMMALs and Some Supplemental AMMALs

NSN	Nomenclature	core7002 IDC	core7006 Sub Tend	core7010 Sub	core7015 GMO/PA	core7024 Carrier	core7032 LHA/LHD	supp7001 IDC	supp7007 Sub Tend	supp7011 Sub	supp7016 GMO/PA	supp7025 Carrier	supp7033 LHA/LHD
650500598530	ANTIPYRINE AND BENZOCAINE OTC SOLUTION 10ML	•	•	•	TRUE	TRUE	TRUE	•	•	•	•	•	•
6505012502914	DILTIAZEM HYDROCHLORIDE TABLETS 120MG 100 TABS	TRUE	•	TRUE	TRUE	TRUE	TRUE	•	•	•	•	•	•
6515011535752	ELECTRODE EKG PREGELLED 4.4CM 25 PER BOX	•	•	•	•	TRUE	TRUE	•	TRUE	TRUE	TRUE	•	•
6515011498839	GLOVES SURGEONS GEN SURG SZ 6.5 50 PAIRS	TRUE	TRUE	•	TRUE	TRUE	TRUE	•	•	•	•	•	•
6505014320378	HEPATITIS A VACCINE 50UN/IML IML SYRINGE 5/PG	•	•	•	•	TRUE	•	TRUE	•	•	TRUE	•	TRUE
6515001181341	INTRAVENOUS INJ SET DROPS/ML 72IN LG 48S	TRUE	TRUE	TRUE	TRUE	•	TRUE	•	•	•	•	•	•
650501159852	NALBUPHINE HCL INJECTION 10MG/ML IML AMPUL 10S	TRUE	TRUE	TRUE	•	•	•	•	•	•	•	•	•
6505011555157	NAPROXEN SODIUM TABLETS USP 275MG 100 TABS	TRUE	TRUE	TRUE	TRUE	TRUE	•	•	•	•	•	•	•
6505011306832	NAPROXEN SODIUM TABLETS USP 275MG 500 TABS	•	•	•	•	•	TRUE	•	•	•	•	•	•
6505001178579	PENICILLIN V POTASSIUM 400000 UNITS 40 TABS/BOTTLE	TRUE	TRUE	TRUE	TRUE	•	TRUE	•	•	•	•	•	•
6505000654214	PROMETHAZINE HCL SUPPOSITORIES 25MG 12S	TRUE	TRUE	TRUE	TRUE	•	TRUE	•	•	•	•	•	•
6505001384995	PYRIDOXINE HYDROCHLORIDE TABLETS USP 50MG 100S	TRUE	TRUE	•	TRUE	TRUE	TRUE	•	•	•	•	•	•
6505011607702	RANITIDINE TABLETS USP 150MG 60 TABLETS PER BT	TRUE	•	•	TRUE	•	TRUE	•	•	•	•	TRUE	•
6515003634100	SAW FINGER RING .75IN BLADE DIAMETER 6IN HANDLE	TRUE	•	TRUE	•	•	•	•	•	•	•	TRUE	TRUE
6515012508936	SPLINT TRACTION-EXTRICATION ADULT ALUM W/CASE	TRUE	TRUE	TRUE	TRUE	•	•	•	•	•	•	TRUE	•
6505013856328	TYPHOID VACCINE MODIFIED 10ML VIAL 20 DOSES	TRUE	TRUE	•	TRUE	•	TRUE	•	•	•	•	TRUE	•
6515012929814	VEST ASSEMBLY EXTRICATION HALF BACK C-SPINE	•	•	TRUE	•	•	•	•	•	•	•	•	•
6530001276612	WRAPPER STERILIZATION NONWOVEN 24IN BLUE 500S	TRUE	TRUE	TRUE	TRUE	TRUE	•	•	•	•	•	•	TRUE

Table 2

Core Items Appearing in All Core AMMALs and Some Supplemental AMMALs

NSN	Nomenclature	core7002 IDC	core7006 Sub Tend	core7010 Sub	core7015 GMO/PA	core7024 Carrier	core7032 LHA/LHD	supp7001 IDC	supp7007 Sub Tend	supp7011 Sub	supp7016 GMO/PA	supp7025 Carrier	supp7033 LHA/LHD
6515003478600	MIRROR LARYNGEAL .75IN DIAMETER PLAIN GLASS	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	•	•	TRUE	•	•	•
6515011432880	SUTURE ABS SURG GI SZ 2-0 ARMED 27IN LG POLY 36S	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	•	•	TRUE	•	•	•
6515001872682	SUTURE NONABS SURG SZ 6-0 18IN ARMED NYLON 36S	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	•	•	TRUE	•	•	•

Table 3

Core Items Appearing in all Six Supplemental AMMALs

NSN	Nomenclature	core7002 IDC	core7006 Sub Tend	core7010 Sub	core7015 GMO/PA	core7024 Carrier	core7032 LHA/LHD	supp7001 IDC	supp7007 Sub Tend	supp7011 Sub	supp7016 GMO/PA	supp7025 Carrier	supp7033 LHA/LHD
6505007540280	CHLORAMPHENICOL SODIUM 1 GRAM VIAL 10/BOX	•	•	•	•	•	•	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
6505011875540	CLINDAMYCIN INJECTION 150MG/ML 6ML VIAL 25S	•	•	•	•	•	•	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
6505012139514	GENTAMICIN INJECTION USP 40MG/2ML 2ML VI 25S	•	•	•	•	•	•	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
6510014833333	TOWELETTE BENZALKONIUM CHLORIDE 8x3IN 100S	•	•	•	•	•	•	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

## Conclusions

The present paper discussed a computer program created to provide visibility necessary to monitor the effect of changes on the organizational integrity of the Fleet's core and supplemental AMMALs. While failure to maintain this integrity will in no way affect the quality of care aboard ship, it does promote efficient utilization of medical resources afloat and facilitates the inventory and maintenance activities of ships' medical departments.

A significant amount of effort was required to develop and implement the concept of a core set of materiel. Preserving the results of this effort will require a periodic maintenance examination of the core/supplemental AMMALs. Correction of some discrepancies can be conducted on an administrative basis without requiring a review by clinical personnel. The items listed in Tables 2 and 3 are examples of discrepancies that can be corrected administratively. Other discrepancies will require input from the type commands for remediation.

The core/supplemental organizational structure is a significant step forward in managing the Fleet's AMMALs and standardizing medical items across the operational force. The next step is to begin standardizing the Fleet's remaining 274 Authorized Medical Allowance Lists. The items in the current core and supplemental AMMALs would form a basic set of items. Many of the items in the remaining AMMALs are the same or serve similar purposes. These items could then be matched with the like items in the core/supplemental AMMALs and changed to reflect the single, standardized item.

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14. ABSTRACT (maximum 200 words) <p>The study's objective was the development and evaluation of an automated method that examines the Fleet's AMMALs and compares them in a way that identifies discrepancies so that errors may be addressed on an on-going basis. To accomplish the objective, a computer program was created that first took the 12 different AMMALs, for the 3 different force types and combined and then reorganized them into core AMMAL items and supplemental AMMAL items. Next, the program compared them so that it could be determined that each core item was present in each of the 6 core AMMALs. Subsequently, the program reorganized them so that it could be determined that none of the core items appeared in any 6 of the supplemental AMMALs. Finally, the AMMALs were examined to determine that none of the supplemental AMMALs had items that were common to all 6 of the Fleet's supplemental AMMALs. Upon completion of the examination, the program produced spreadsheets summarizing findings. Results revealed discrepancies in each of the potential views. This included (1) core AMMAL items that did not appear in all core AMMALs, (2) core items that appeared both in all core AMMALs and in some supplemental AMMALs, and (3) core items that appeared in all supplemental AMMALs. A total of 25 discrepancies were found. A significant amount of effort was required to develop and implement the concept of a core set of materiel. To preserve the results of this effort will require that a periodic maintenance examination of the core/supplemental AMMALs be performed. Correction of some discrepancies can be conducted on an administrative basis without requiring a review by clinical personnel. Other discrepancies, however, will require input from the type commands for remediation. The core/supplemental organizational structure has been demonstrated as a significant step forward in both managing the Fleet's AMMALs, and by standardizing medical items across the operational force.</p>					
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